

Decision Support Tool For Evaluating Life-Cycle Environmental Tradeoffs and Full Costs of Municipal Waste Management

Susan Thorneloe
Senior Environmental Engineer
ORD/NRMRL/APPCD
(919) 541-2709
thorneloe.susan@epa.gov

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Public officials have been making difficult decisions for more than a century regarding the proper management, environmental impacts, and costs associated with collection, transportation, recycling, and disposal of municipal solid waste (MSW). These decisions are often controversial, and officials have had limited or conflicting information on which to base decisions. The United States generates approximately 230 million tons per year and spend approximately \$40 billion per year on MSW management. There has been a tremendous need for a tool that provides objective, credible, scientifically-based information for evaluating solid waste management.

In response to requests from local and state government, EPA's Office of Research Development has conducted research to develop the tools and data needed for developing a MSW decision support tool (DST). This work was co-founded by the U.S. Department of Energy through an Interagency Agreement. The MSW DST was developed in partnership with over 80 stakeholders with representatives from state and local government; the solid waste management industry; the aluminium, glass, paper, plastics, and steel industries; environmental interest groups; trade associations; and academia. A series of external peer reviews were conducted to evaluate the process models, life-cycle inventory data, and DST. Feedback has been positive and complimentary. The MSW DST has been used in over 30 communities and states to date to predict and evaluate life-cycle environmental tradeoffs and full costs of MSW management from cradle to grave.

This research was conducted through a competed cooperative agreement between EPA/ORD and the Research Triangle Institute (RTI) and its partners, including North Carolina State University, University of Wisconsin-Madison, and Franklin Associates, Ltd. The tool provides a holistic evaluation of the life-cycle environmental tradeoffs providing data on a multi-media, multi-pollutant basis. It also provides information on energy, including emissions on a regional and national basis for energy consumption and off-sets from resource conservation and fossil fuel avoidance. The tool has the flexibility to consider existing infrastructure, waste management practices and composition, and recycling/waste management goals. The tool has optimization capability that can be used to find solutions that are more efficient in terms of cost or environmental improvement.

Historically, life-cycle assessment (LCA) is used on a product-specific basis. Through ORD's leadership, a LCA methodology was developed that cuts across multiple products and processes. In addition, ORD was instrumental in the development/collection of LC data, process modeling, and DST development that provide for a holistic approach to solid waste management.